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Walz

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(54) **CONNECTOR FOR PLATES, PARTICULARLY
FOR SHELVES OR TRAYS**

(75) Inventor: **Rüdiger Walz**, Haigerloch (DE)

(73) Assignee: **Häfele GmbH & Co. KG**, Nagold (DE)

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F16B 7/04 (2006.01)

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108/153.1; 312/111

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248/188, 188.1; 108/158.12, 153.1; 312/118,
312/111, 265.2, 259

See application file for complete search history.

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Primary Examiner—Daniel P Stodola

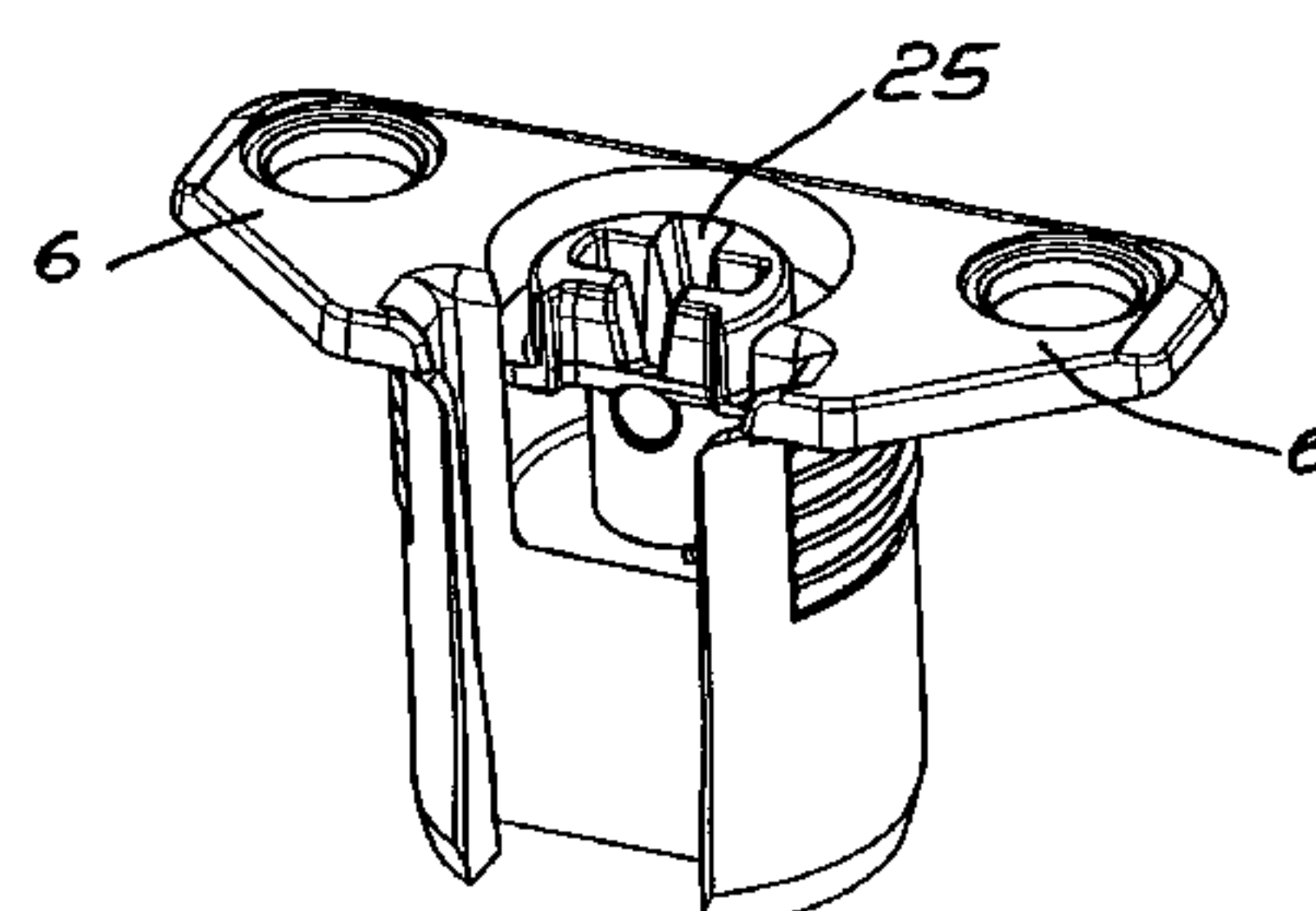
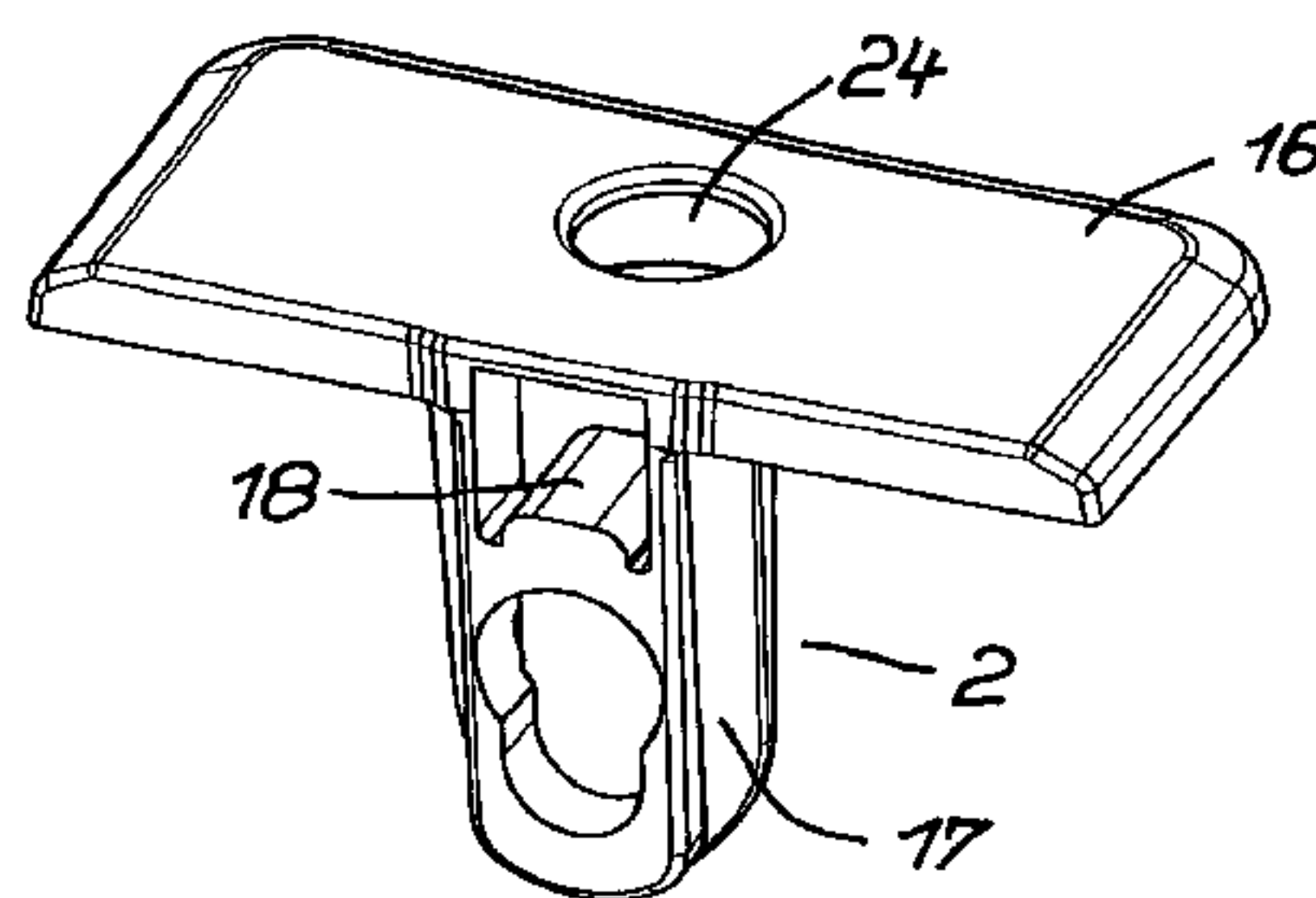
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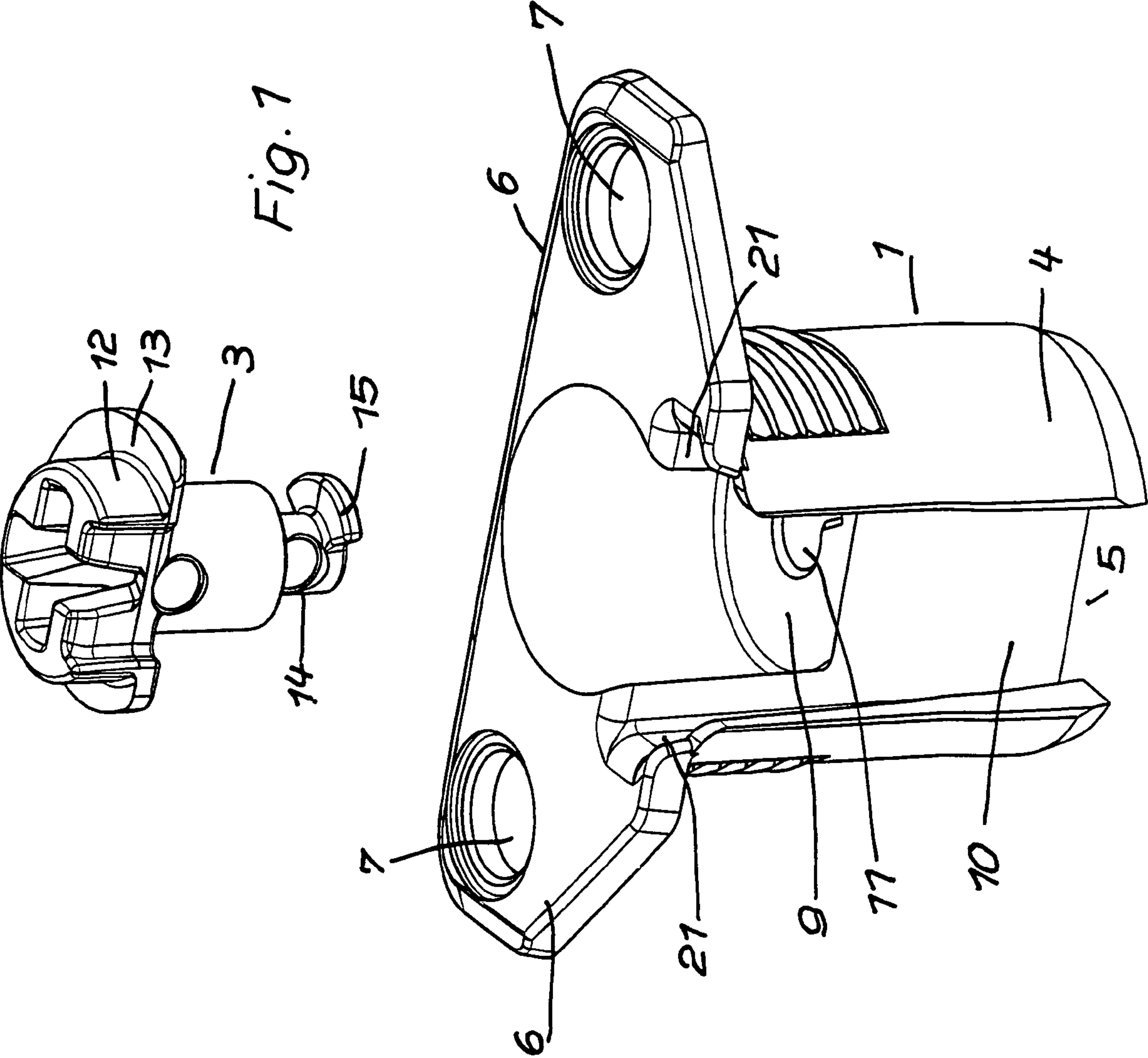
(74) *Attorney, Agent, or Firm*—Friedrich Kueffner

(57) **ABSTRACT**

A connector for plates, particularly for shelves or trays, includes a mounting member which is insertable into a recess of a first part, wherein a fastening member for a second part is insertable into the mounting member approximately in axial direction. A bolt or the like which is rotatable between a release position and a locking position is mounted in the mounting member, wherein a support member is provided between the bolt and the wall of the mounting member on the circumference of the bolt, and wherein the bolt and/or the support member have for pressing against each other a particularly arc-shaped thickened portion or at least a partially eccentric configuration.

12 Claims, 9 Drawing Sheets





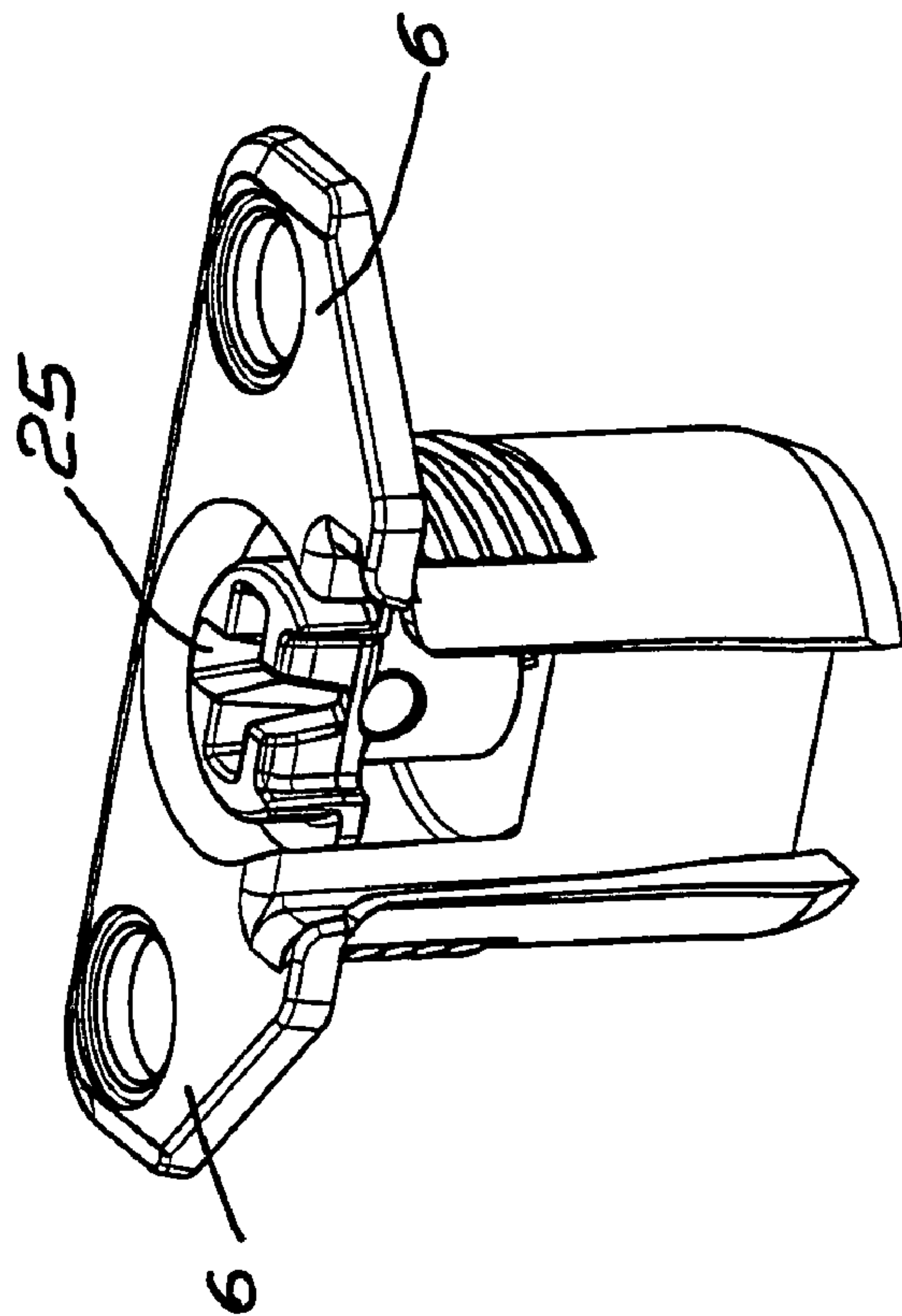
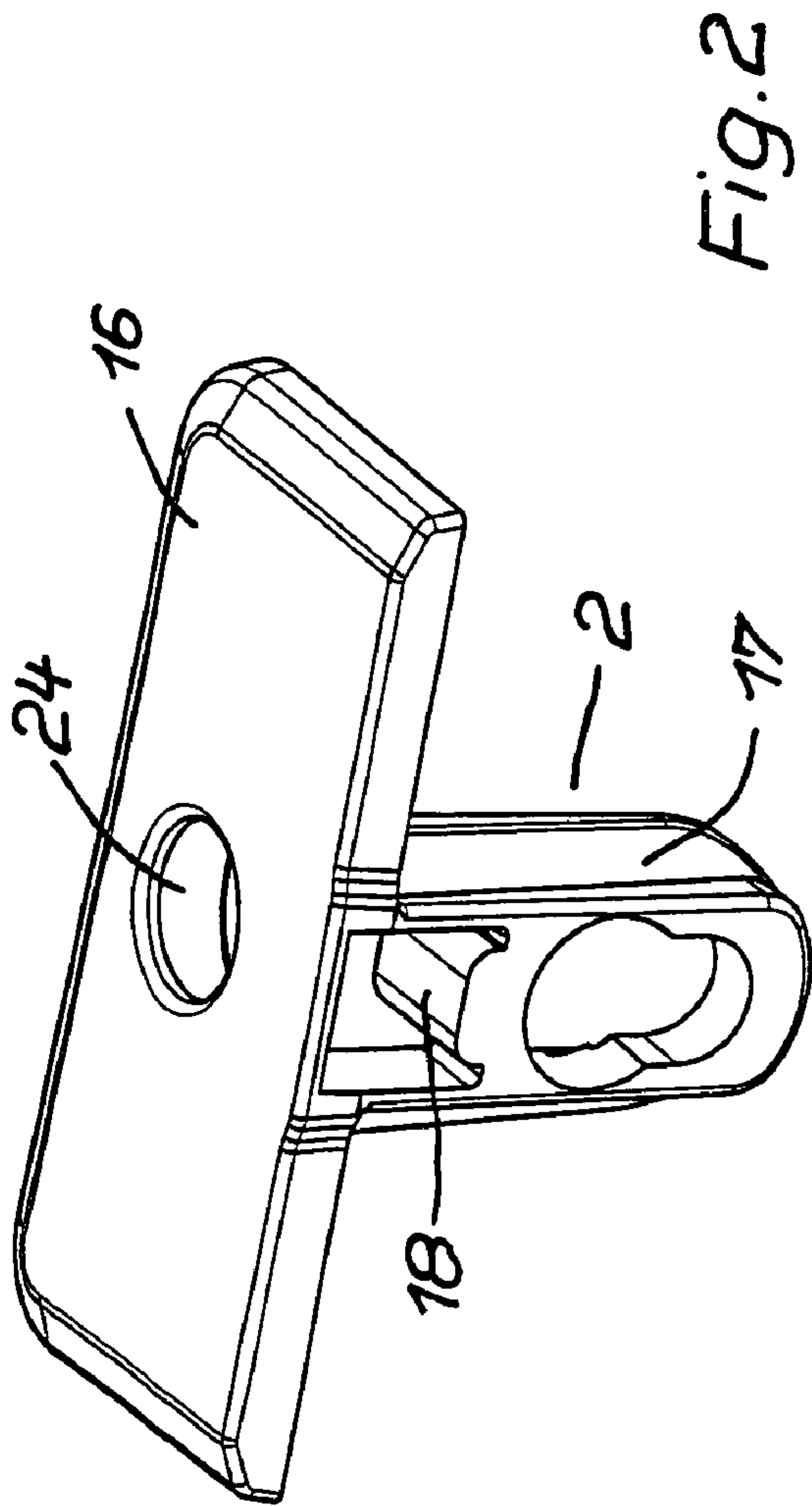


Fig. 3

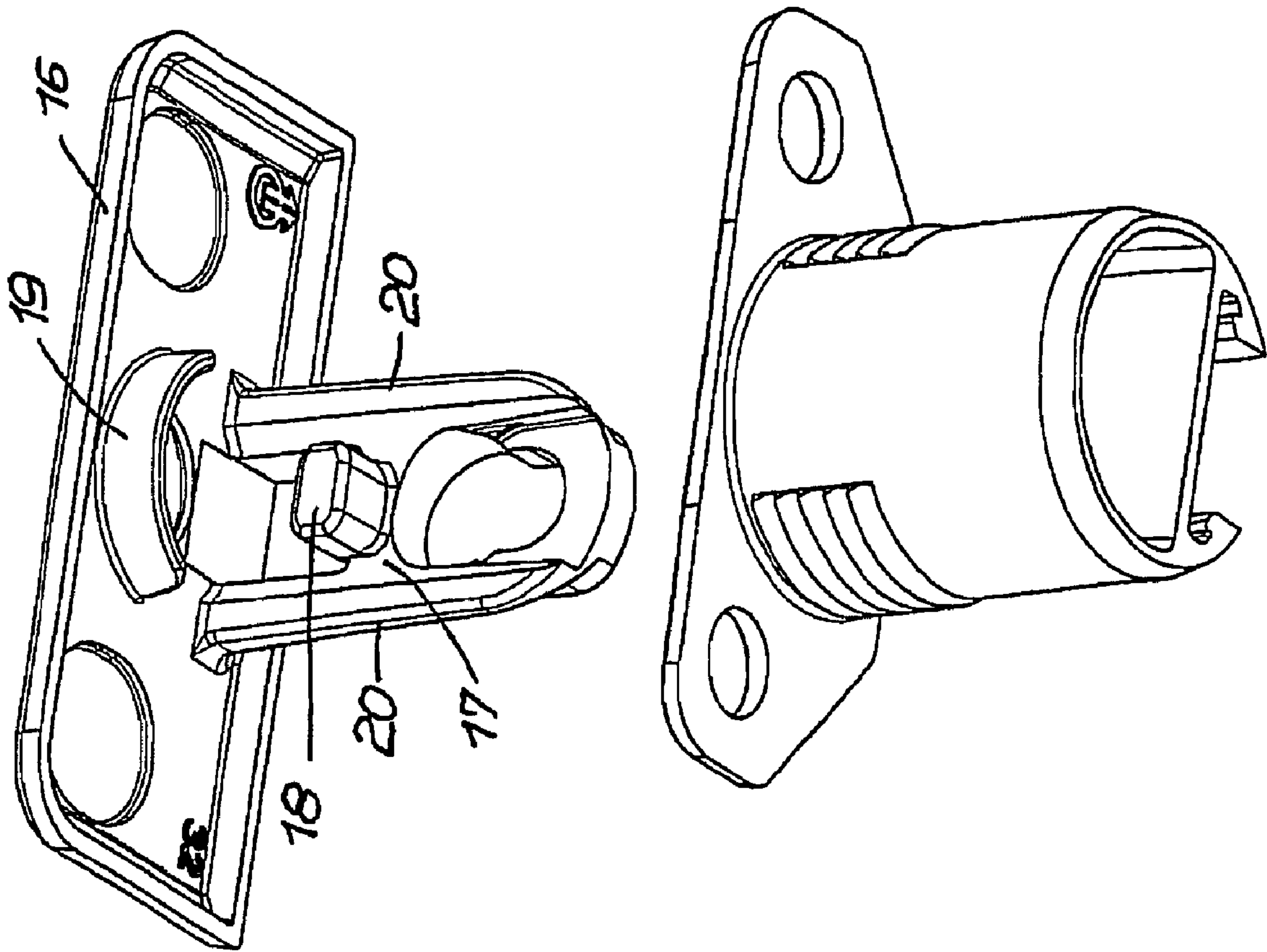
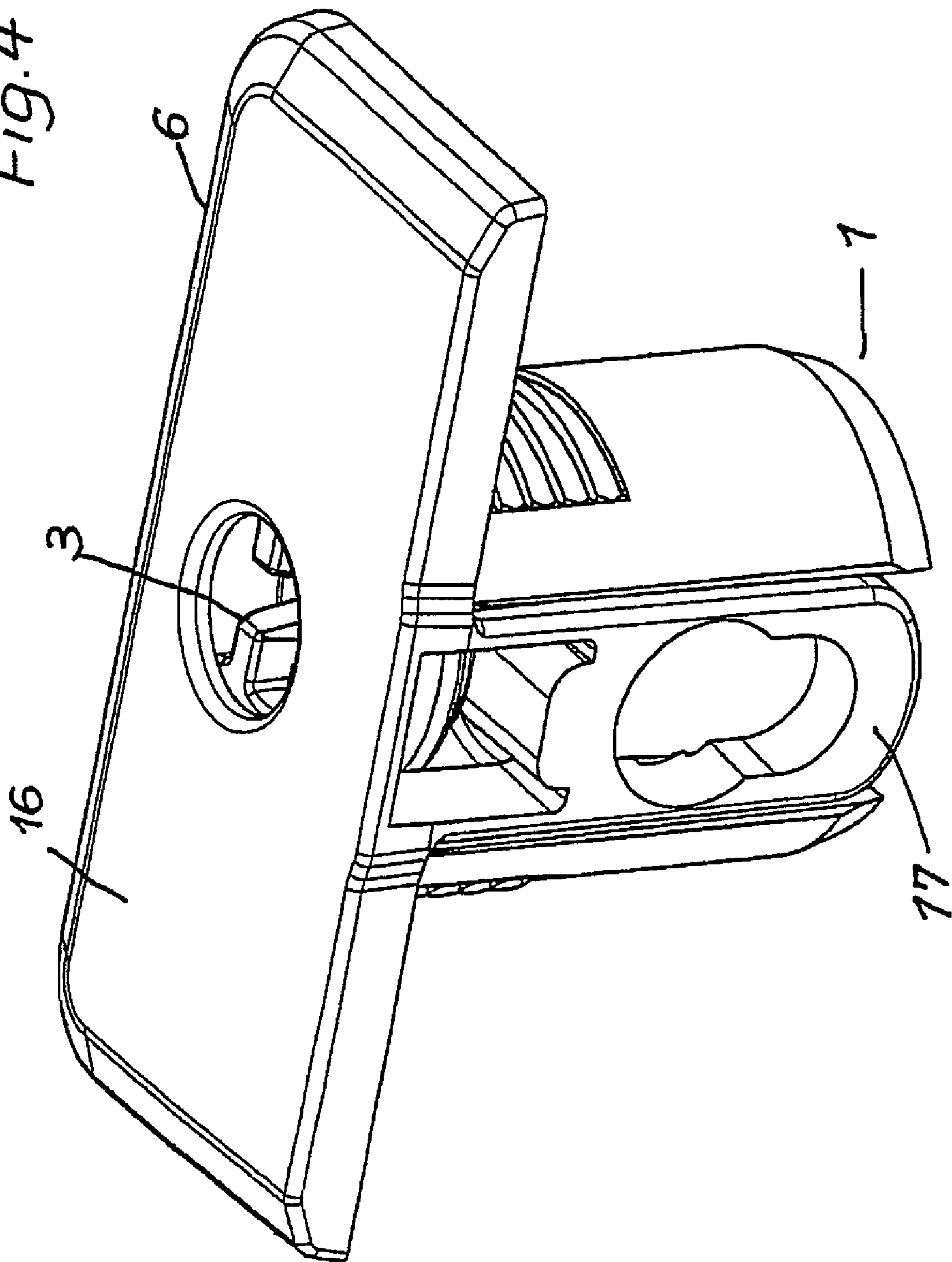
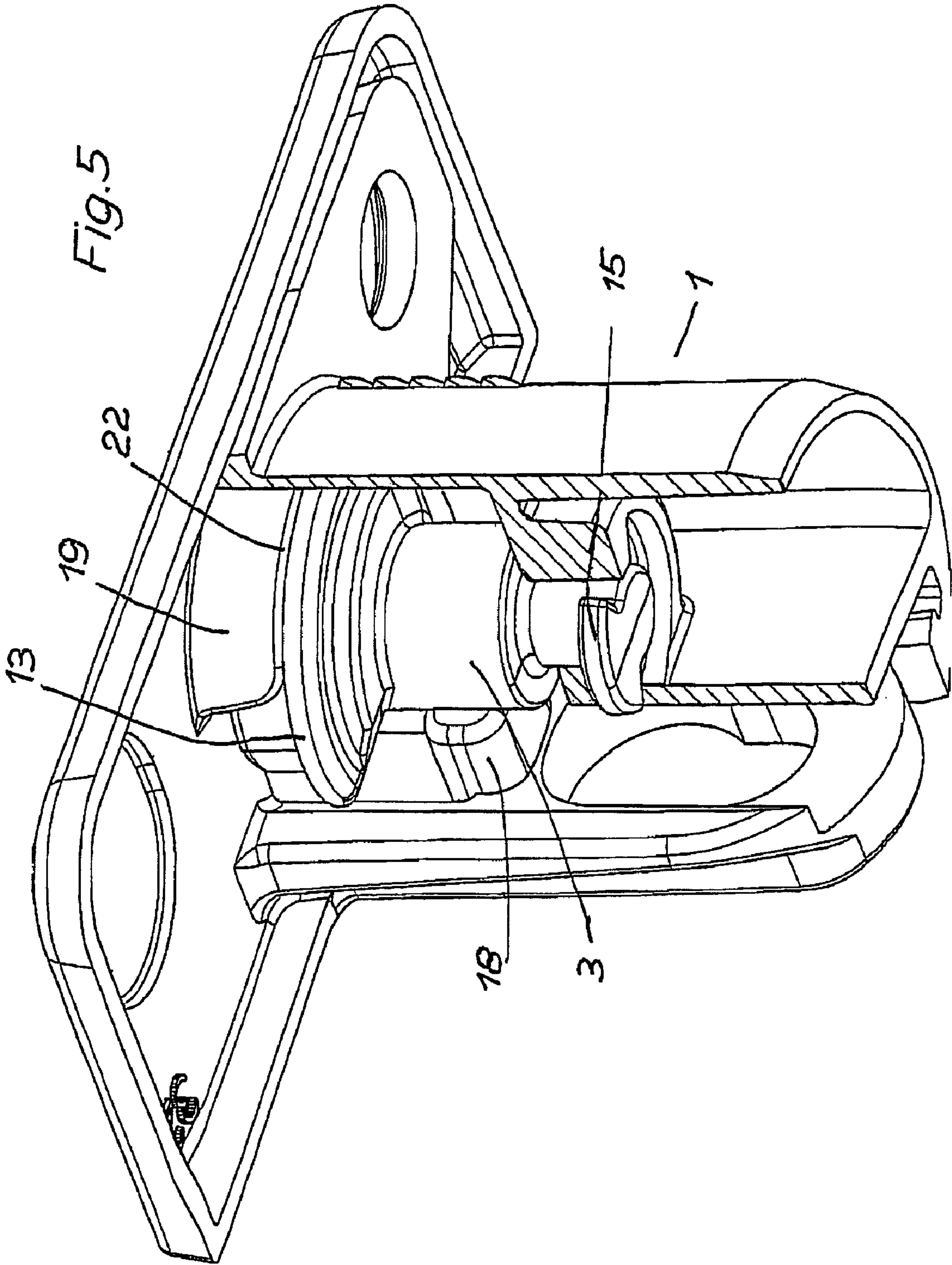


Fig. 4





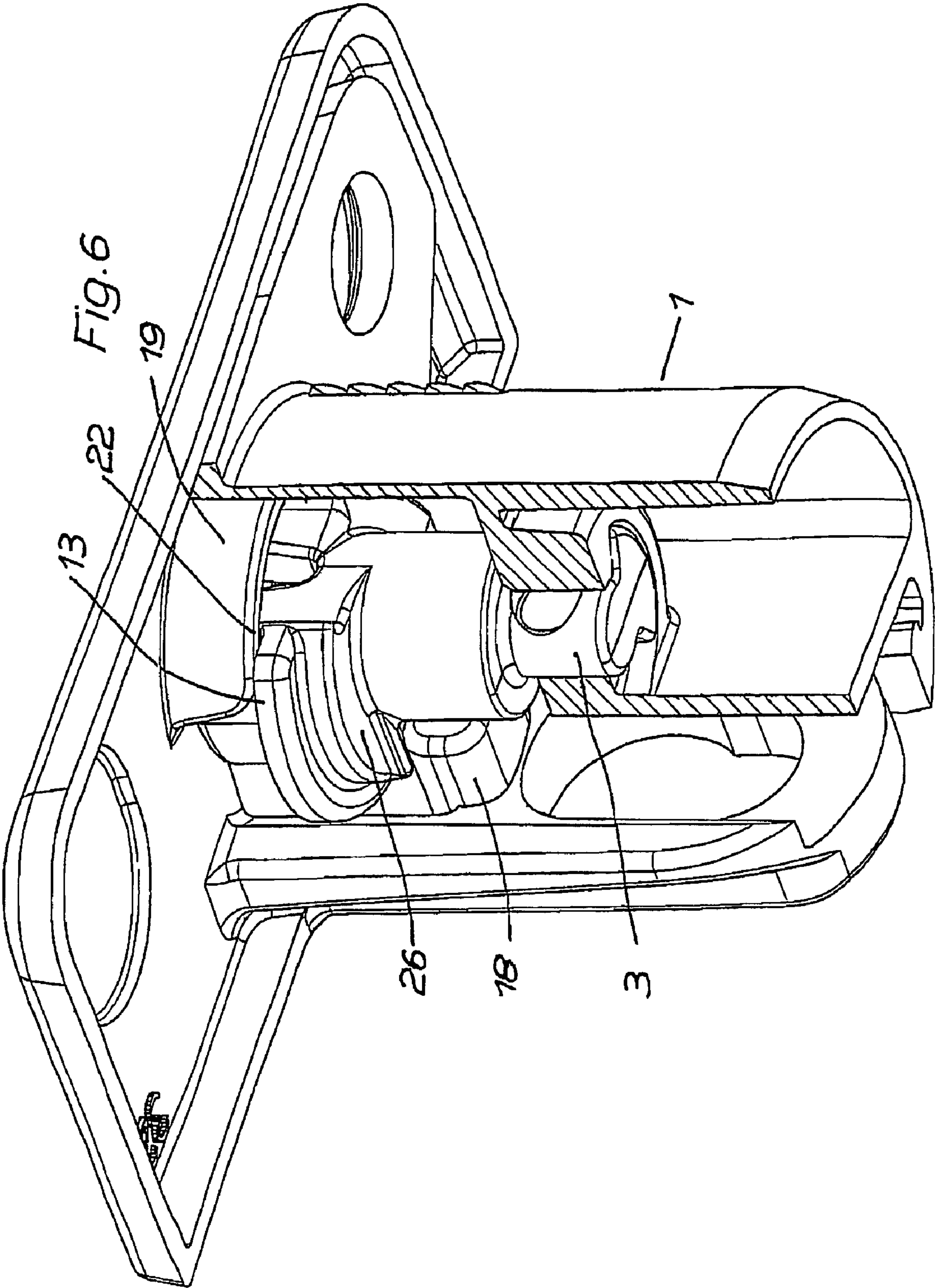


Fig. 7

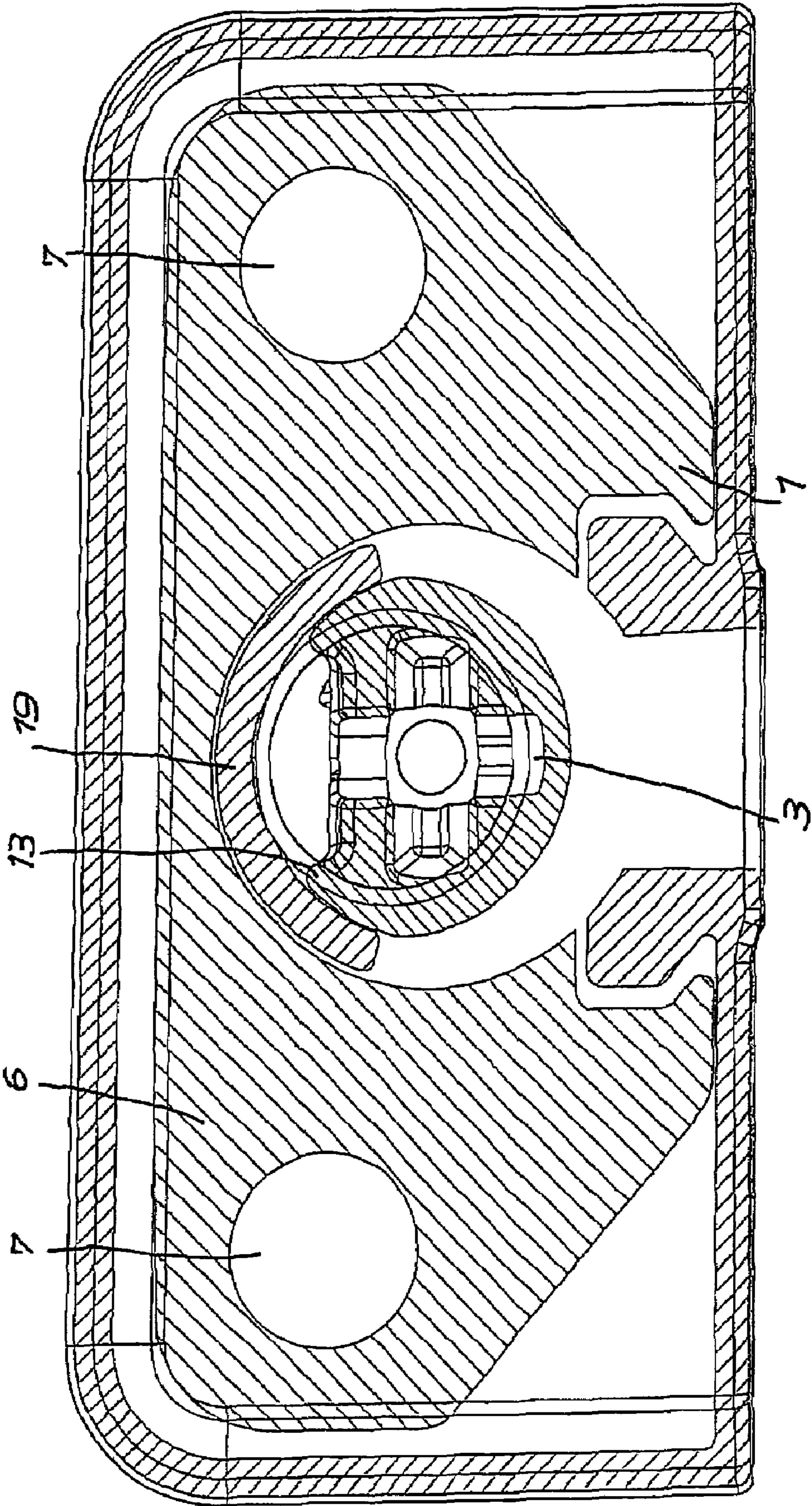
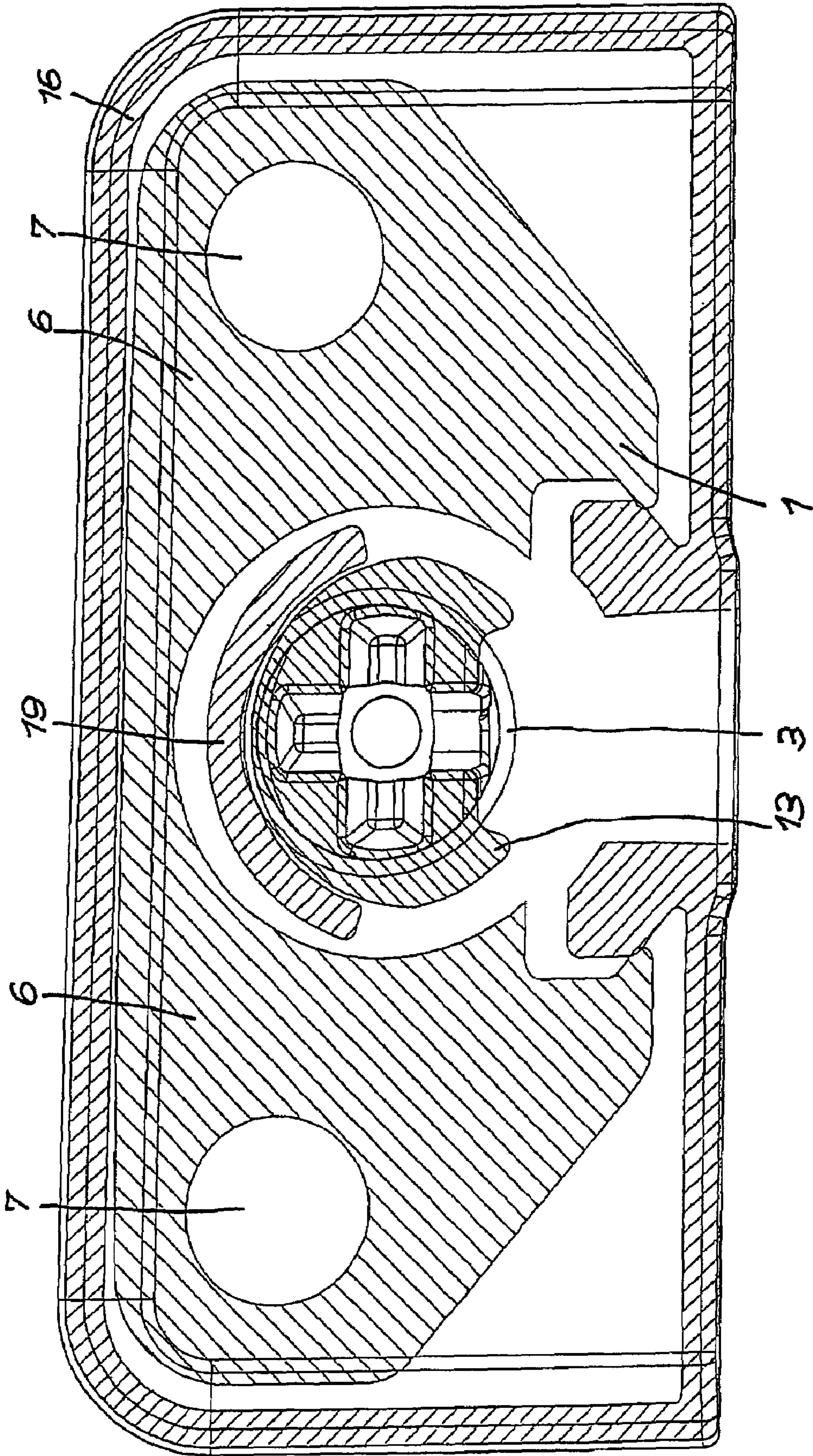
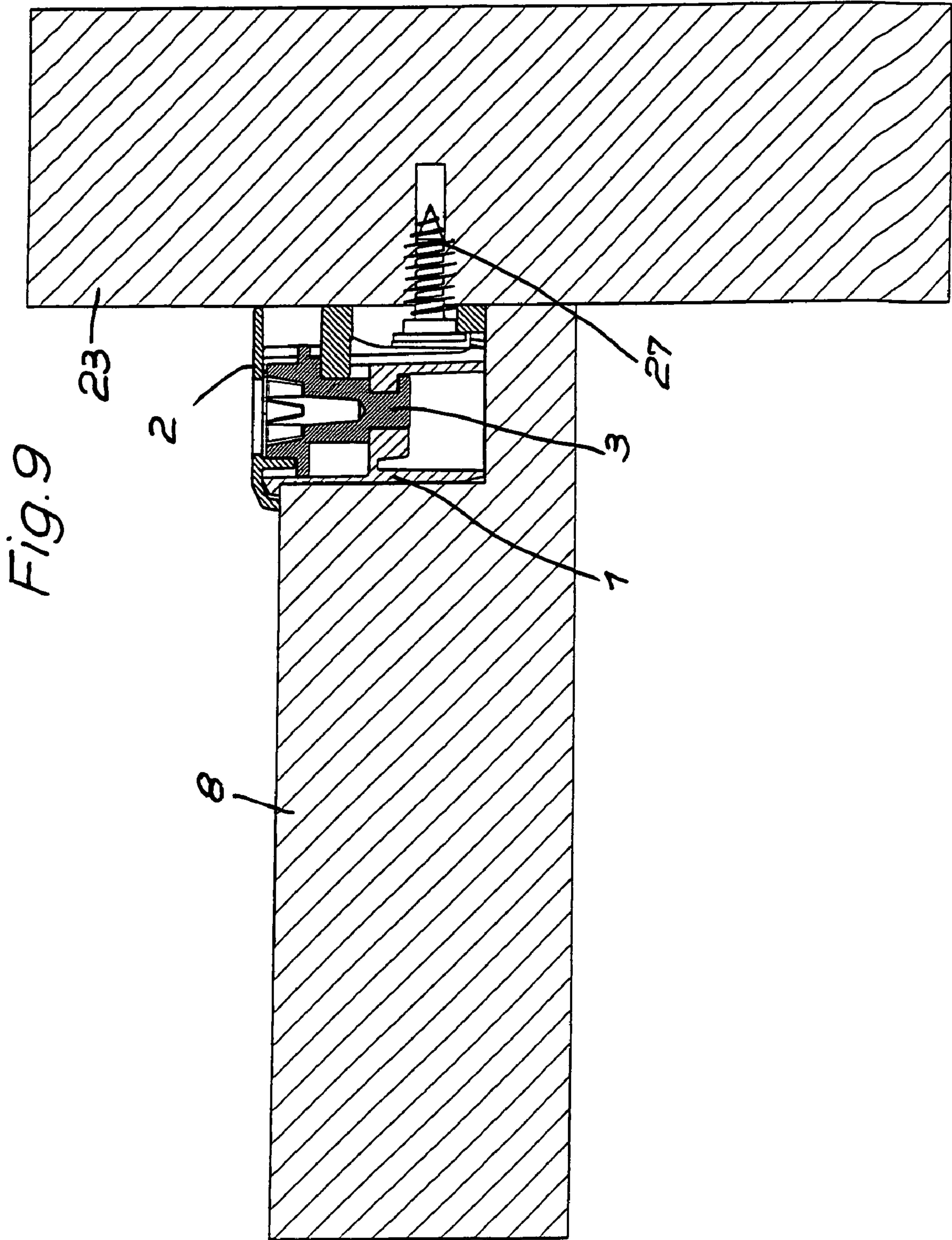


Fig. 8





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CONNECTOR FOR PLATES, PARTICULARLY FOR SHELVES OR TRAYS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a connector for plates, particularly for shelves or trays. The connector includes a mounting member which is insertable into a recess of a first part, wherein a fastening member for a second part is insertable into the mounting member approximately in axial direction.

2. Description of the Related Art

In a known embodiment of this type, a locking disk is rotatably mounted in the mounting member, wherein the locking member engages in a groove of the fastening member. In this embodiment, the support surface of the groove and the contact surface of the locking disk have oppositely directed inclinations, so that the fastening member is axially pressed against the mounting member.

In another, connector or fitting, the fastening member includes a bolt with a recess, wherein a locking member rotatably arranged in the mounting member engages in the recess of the bolt. While this produces the result that the connector is tensioned vertically as well as horizontally, the bolt is clamped transversely of its direction of insertion, so that shearing forces act on the bolt.

SUMMARY OF THE INVENTION

It is the primary object of the present invention to provide a connector of the above-described type in which parts of the connecting fitting, and, thus, of the plates or the like, are pressed together in the longitudinal direction as well as in the transverse direction of the connector fitting, without having any shearing forces act on the connector.

In accordance with the present invention, a bolt or the like which is rotatable between a release position and a locking position is mounted in the mounting member, wherein a support member is provided between the bolt and the wall of the mounting member on the circumference of the bolt, and wherein the bolt and/or the support member have for pressing against each other a particularly arc-shaped thickened portion or at least a partially eccentric configuration.

A particularly favorable construction of the support member is achieved if it is constructed as an arc-shaped wall member which partially surrounds the bolt and is approximately axially directed. The bolt preferably has a flange which rests against the lower edge of the support member, so that the axial position of the bolt is ensured. Also provided for locking the bolt is a pin arranged on the fastening member, wherein the pin extends up to the bolt to approximately a location transversely of the longitudinal axis thereof. This pin is advantageously located below the flange of the bolt.

In accordance with a preferred embodiment, the mounting member is approximately tubular and at least partially slotted in the axial direction.

The mounting member additionally has at the edges of its slot obliquely downwardly inclined dove-tail shaped guide grooves for cylinder fastening member.

Provided in the mounting member for supporting the bolt is a transverse bottom which for reasons of stability is additionally reinforced by an axially extending transverse wall. The bolt itself has at its lower end a guide pin, a locking disk and the bottom has a corresponding recess, wherein the locking disk engages under the bottom at least in the locking position of the bolt.

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The mounting member is preferably provided for resting on a plate to be fastened with one or more laterally protruding plate-shaped rings with recesses for screws or the like. The fastening member is constructed as a cover plate which protrudes beyond the mounting member and has a perpendicularly extending leg which is insertable into the grooves of the mounting member, wherein the leg supports a pin which is directed approximately transversely of the longitudinal axis of the leg. Due to the plate-shaped configuration, the screws which serve for fastening the mounting member can be covered. Provided in the leg of the mounting member is at least one recess, particularly two recesses, for fastening screws or the like. The cover plate additionally has an opening toward the bolt and the bolt has at its end opposite the bearing pin one or more slots for the engagement of a tool.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of the disclosure. For a better understanding of the invention, its operating advantages, specific objects attained by its use, reference should be had to the drawing and descriptive matter in which there are illustrated and described preferred embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWING

In the drawing:

FIG. 1 is a perspective exploded view of the mounting member of the connector of the present invention with a bolt prior to insertion;

FIG. 2 is a perspective view of the mounting member with inserted bolt and with fastening member prior to insertion;

FIG. 3 is a rear view of the connector shown in FIG. 2;

FIG. 4 is a perspective view of the assembled connector;

FIG. 5 is a perspective rear view of the connector, partially in section and on a larger scale, of the mounting member with inserted bolt and fastening member in the released position of the bolt;

FIG. 6 is an illustration of the connector of FIG. 5 shown in the locking position of the bolt;

FIG. 7 is a sectional view of the connector of FIG. 5;

FIG. 8 is a sectional view of the connector of FIG. 6; and

FIG. 9 is a sectional view of two plates connected by means of the connector of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

As illustrated in FIGS. 1 and 2, the connector is composed of three parts, namely, the mounting member 1, the fastening member 2 and bolt 3.

The mounting member 1 is composed of a tubular base body 4 which has a longitudinal slot 5 which extends in the axial direction. Particularly for the connection for honeycomb-type plates, at the upper end of the tubular base body 4 are provided two laterally protruding plates 6 with recesses 7 for fastening screws, not shown. In the mounted state, mounting member rests on the surface of a plate 8 with these rings and is connected by means of fastening screws, as illustrated in FIG. 9. A transverse bottom 9 is arranged approximately in the middle of the tubular base body 4, wherein the transverse bottom 9 is additionally supported by an axially extending transverse wall 10. The transverse bottom 9 has a recess 11 for the bolt 3.

The bolt 3 can be rotatably mounted in the tubular base body 4 of the mounting member 1 on the transverse bottom 9. Located below the bolt head 12 is a unilaterally cut flange 13 with a slight inclination opposite the direction of rotation into the locking position. A bearing pin 14 is provided at the lower

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end, wherein the bearing pin **14** engages in the recess **11** of the transverse bottom **9** and engages under the transverse bottom line with a locking disk **15** at least in the locked position of the connector. The recess **11** is shaped in such a way that the bolt **3** can be inserted at least in the released position according to FIG. **4** together with the bearing pin **14** and the locking disk **15** into the recess **11** of the bottom part **9**. Upon a rotation into the locking position according to FIG. **5**, the locking disk **15** engages under the transverse bottom **9**, so that the bolt **3** is held in its axial position. In addition, as seen in FIG. **6**, the bolt **3** has underneath its flange **13** a stop **26** whose operation shall be explained further below.

The fastening member **2** is composed of a plate **16** which after being mounted in the mounting member, with its wings **6** covers the mounting member **1** and a leg **17** extending perpendicularly of the plate **16**. Arranged on the leg **17** is an inwardly directed pin **18** extending transversely of the axial direction for contacting the bolt **3** and, thus, for locking the bolt **3**. The plate **16** has opposite the leg **17** an arc-shaped wall portion **19** which protrudes downwardly from the plate **16** and partially surrounds the bolt head **12**. Moreover, the leg **17** is provided at its rear edge with two guide rails **20** which engage in two obliquely downwardly and inwardly directed dovetail-shaped guide bolts **12** provided at the edges of the longitudinal slot **5** of the mounting member **1**. The mounting member **1** can only be inserted as long as the bolt **3** is in the released position according to FIG. **4**.

When the bolt **3** is rotated in the clockwise direction, the eccentrically-shaped bolt head **12** presses against the wall part **19** which acts as a contact pressure member, so that the fastening member **2** is pressed against the mounting member **1**. The fastening member **2** is simultaneously pressed against the mounting member **1** in the axial direction by means of the inclined flange **13** which rests against the lower edge **22** of the wall part **19**. This results in a firm connection of the parts to each other in the vertical as well as in the horizontal direction, wherein this connection is also transmitted to the plates **8**, **23** which are connected, as seen in FIG. **9**. In order to prevent a further rotation beyond the locked position, the stop **26** rests in this position against the pin **18**, as seen in FIG. **6**. The parts can also be once again separated from each other without problems by rotating the bolt **3** back from the locked position according to FIG. **5** into the released position according to FIG. **4**.

In order to facilitate an easy adjustment of the bolt **3**, a cutout **24** which exposes the bolt **3** is provided in the cover plate **16** and one or more slots **25** for the engagement of a tool are provided in the bolt **3**.

FIGS. **7** and **8** show in sectional views the respective positions of the mounting member **1** and the fastening member **2** relative to each other in the two end positions of the bolt **3**. FIG. **7** shows the release position and FIG. **8** shows the locked position. FIG. **9** shows the use of the connector for shelves or trays, wherein the connector **1** is arranged in a recess of the plate **8** and the fastening member **2** is fastened by means of a screw **27** to the second plate **23**.

While specific embodiments of the invention have been shown and described in detail to illustrate the inventive principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

I claim:

1. A connector for plates, the connector comprising a mounting member insertable into a recess of a first part, a fastening member connected to a second part, the fastening member comprising a leg, a coverplate having an arcuate support member with a partially eccentric configuration and

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being insertable approximately in an axial direction into the mounting member, further comprising a bolt which is rotatable between a released position and a locked position, the support member being arranged on a circumference of the bolt between the bolt and a wall of the mounting member, and wherein the fastening member is inserted into the mounting member, wherein at least part of the bolt and the support member have a mutual contact pressure, wherein the bolt has a flange resting against a lower edge of the support member, wherein the flange has an inclination against the direction of rotation of the bolt into the locking position.

2. The connector according to claim **1**, wherein the support member is an arc-shaped wall portion which is approximately axially directed and partially surrounds the bolt.

3. The connector according to claim **1**, wherein the mounting member is approximately tubular and has at least one partial slot extending in the axial direction.

4. The connector according to claim **3**, wherein the mounting member has at edges of the slot inclined dovetail-shaped guide grooves which extend downwardly and inwardly for receiving the fastening member.

5. The connector according to claim **1**, wherein the bolt has at a lower end thereof a bearing pin with locking disk and the transverse bottom has a corresponding recess, wherein the locking disk engages under the transverse bottom at least in the locking position of the bolt, wherein the mounting member has a transverse bottom for supporting the bolt.

6. The connector according to claim **5**, wherein the transverse bottom is supported by an axially extending transverse wall.

7. The connector according to claim **5**, wherein the cover plate protrudes beyond the mounting member, the cover plate having a leg extending perpendicularly of the cover plate and insertable into the guide grooves of the mounting member, wherein the leg has the pin which extends approximately transversely of a longitudinal direction thereof.

8. The connector according to claim **7**, wherein the cover plate has an opening and the bolt has at an end opposite the pin one or more slots for an engagement of a tool.

9. The Connector according to claim **1**, wherein the mounting member has at least on laterally protruding plate-shaped wing with recess for a screw which rests on one of the plates to be fastened.

10. A connector for plates, the connector comprising a mounting member insertable into a recess of a first part, a fastening member connected to a second part, the fastening member comprising a leg, a cover plate having an arcuate support member with a partially eccentric configuration and being insertable approximately in an axial direction into the mounting member, further comprising a bolt which is rotatable between a released position and a locked position, the support member being arranged on a circumference of the bolt between the bolt and a wall of the mounting member, and wherein the fastening member is inserted into the mounting member, wherein at least part of the bolt and the support member have for a mutual contact pressure, wherein the bolt has a flange resting against a lower edge of the support member, wherein the fastening member has a pin extending in the mounting member to the bolt approximately transversely of a longitudinal axis thereof.

11. The connector according to claim **10**, wherein the bolt has a stop interacting with the pin for limiting the direction of rotation of the bolt past the locking position thereof.

12. The connector according to claim **10**, wherein the pin is located underneath the flange of the bolt.